WHAT IS CLAIMED IS:

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22. An isolated and purified nucleic acid or fragment thereof that codes for a plant or animal nuclear base transporter comprising:

a) a nucleic acid that is obtainable through complementation of nuclear base transporter-deficient host cells with a plant or animal gene bank and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases; or

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e);

with the proviso that nucleic acids with a sequence according to one of the SEQ ID NO 3 to 5 are excluded.

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24. The nucleic acid according to Claim 1 that includes a coding sequence according to SEQ ID NO:1, 2, 6, 7, or 10, or a derivative of a coding sequence according to SEQ ID NO:1, 2, 6, 7, or 10 derived through substitution, addition, inversion and/or deletion of one or more bases.

25. The nucleic acid according to one of the Claim 1, wherein said nucleic acid is a DNA.

26. A fragment of a nucleic acid that codes for a plant or animal nuclear base transporter comprising:

a) a nucleic acid that is obtainable through complementation of nuclear base transporter-deficient host cells with a plant or animal gene bank and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases; or

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e);

with the proviso that nucleic acids with a sequence according to one of the SEQ ID NO 3 to 5 are excluded,

wherein said fragment is characterized in that in anti-sense orientation to a promoter it can inhibit the expression of a nuclear base transporter in a host cell.

27 ~~5.~~ The nucleic acid fragment according to Claim 4, that includes at least 10 nucleotides.

28 ~~6.~~ A construct comprising the sequence of at least a portion of an isolated and purified nucleic acid that codes for a plant or animal nuclear base transporter that itself comprises:

a) a nucleic acid that is obtainable through complementation of nuclear base transporter-deficient host cells with a plant or animal gene bank and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases; or

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e);

with the proviso that nucleic acids with a sequence according to one of the SEQ ID NO 3 to 5 are excluded,

wherein said nucleic acid is under the control of an element regulating expression.

29. The construct according to Claim 6, that is in anti-sense orientation to the regulatory element.

30. The construct according to Claim 6 that is available in a plasmid.

31. A host cell comprising a nucleic acid or fragment thereof that codes for a plant or animal nuclear base transporter comprising:

a) a nucleic acid that is obtainable through complementation of nuclear base transporter-

deficient host cells with a plant or animal gene bank and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases; or

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e);

with the proviso that nucleic acids with a sequence according to one of the SEQ ID NO 3 to 5 are excluded.

10. The host cell according to Claim 9that is selected from bacteria, yeast cells, mamalian cells and plant cells.

11. A transgenic plant, transgenic plant part, seed of the transgenic plant or host cell that comprises a nucleic acid or fragment thereof that

codes for a plant or animal nuclear base transporter comprising:

a) a nucleic acid that is obtainable through complementation of nuclear base transporter-deficient host cells with a plant or animal gene bank and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases; or

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e);

with the proviso that nucleic acids with a sequence according to one of the SEQ ID NO 3 to 5 are excluded.

12. The transgenic plant, part of the transgenic plant, seed or host cell according to Claim 11, wherein said nucleic acid or fragment is

integrated into a site on the genome that does not correspond to its natural position.

35 ~~13~~. A protein obtainable through expression in a host cell of a nucleic acid according to Claim 1 or a nucleic acid having a sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:5.

36 ~~14~~. An antibody that reacts with a protein obtainable through expression in a host cell of a nucleic acid or fragment thereof that codes for a plant or animal nuclear base transporter comprising:

a) a nucleic acid that is obtainable through complementation of nuclear base transporter-deficient host cells with a plant or animal gene bank and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases;

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e); or

g) a nucleic acid having a sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:5.

13. A process for the manufacture of a transgenic plant comprising the following steps:

A. inserting a nucleic acid or fragment thereof that codes for a plant or animal nuclear base transporter comprising:

a) a nucleic acid that is obtainable through complementation of nuclear base transporter-deficient host cells with a plant or animal gene bank and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases;

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e); or

g) a nucleic acid with a sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:5

in a plant cell to make a transformed plant cell; and

B. regenerating a plant from the transformed plant cell.

16. A process for influencing the nuclear base transporter properties of a plant, part of a plant or of seeds, comprising inserting into a plant cell or plant a nucleic acid or fragment thereof that codes for a plant or animal nuclear base transporter comprising:

a) a nucleic acid that is obtainable through complementation of nuclear base transporter-deficient host cells with a plant or animal gene bank and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases;

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e); or

g) a nucleic acid with a sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:5.

39. A use of plant cells for the regeneration and manufacture of entire plants, wherein said plant cells comprise a nucleic acid or fragment thereof that codes for a plant or animal nuclear base transporter comprising:

a) a nucleic acid that is obtainable through complementation of nuclear base transporter-deficient host cells with a plant or animal gene bank and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases; or

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e);

with the proviso that nucleic acids with a sequence according to one of the SEQ ID NO 3 to 5 are excluded.

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18. A use of a nucleic acid or fragment thereof for the isolation of homologous sequences from bacteria, fungi, plants, animals or human beings, wherein said nucleic acid or fragment thereof codes for a plant or animal nuclear base transporter comprising:

a) a nucleic acid that is obtainable through complementation of nuclear base transporter-deficient host cells with a plant or animal gene bank and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases;

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e); or

g) a nucleic acid with a sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:5.

19. A use of a nucleic acid or fragment thereof for the expression of a nuclear base transporter in prokaryotic and/or eukaryotic cells, wherein said nucleic acid or fragment thereof codes for a plant or animal nuclear base transporter comprising:

a) a nucleic acid that is obtainable through complementation of nuclear base transporter-deficient host cells with a plant or animal gene bank

and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases;

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e); or

g) a nucleic acid with a sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:5.

20. A use of a nucleic acid or fragment thereof under the control of a regulatory element in anti-sense orientation for the inhibition of the expression of an endogenous nuclear base transporter in prokaryotic or eukaryotic cells, wherein said nucleic acid or fragment thereof codes for a plant or animal nuclear base transporter comprising:

a) a nucleic acid that is obtainable through complementation of nuclear base transporter-deficient host cells with a plant or animal gene bank and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases;

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e); or

g) a nucleic acid with a sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:5.

43. A use of a nucleic acid or fragment thereof for the manufacture of useful transgenic plants, wherein said nucleic acid or fragment thereof codes for a plant or animal nuclear base transporter comprising:

a) a nucleic acid that is obtainable through complementation of nuclear base transporter-deficient host cells with a plant or animal gene bank and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases;

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e); or

g) a nucleic acid with a sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:5.

~~22~~ 44. A use of a nucleic acid for the identification of inhibitors of nuclear base transport, wherein said nucleic acid or fragment thereof codes for a plant or animal nuclear base transporter comprising:

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a) a nucleic acid that is obtainable through complementation of nuclear base transporter-deficient host cells with a plant or animal gene bank and selection of nuclear base transporter-positive host cells;

b) a nucleic acid with a sequence that codes for a protein having a sequence according to SEQ ID NO:8 or SEQ ID NO:9;

c) a nucleic acid that hyridizes with a nucleic acid according to b);

d) a nucleic acid that, in consideration of degeneration of the genetic code, would hybridize with a nucleic acid according to b) or with the sequence complementary to b);

e) a derivative of a nucleic acid according to a) to d) obtained through substitution, addition, inversion and/or deletion of one or more bases;

f) a nucleic acid complementary to a nucleic acid according to one of the groups a) to e); or

g) a nucleic acid with a sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:5.

45 23. The nucleic acid fragment according to Claim 4 that includes at least 50 nucleotides.

46 24. The nucleic acid fragment according to Claim 4 that includes at least 200 nucleotides.

25. The construct according to Claim 6 wherein said nucleic acid is a fragment characterized in that in anti-sense orientation to a promoter it can inhibit the expression of a nuclear base transporter in a host cell.

26. The construct according to Claim 7 that is available in a plasmid.

27. The nucleic acid according to Claim 2 that is a DNA.

28. The nucleic acid fragment according to Claim 4 the sequence of which includes a portion of coding sequence according to SEQ ID NO:1, 2, 6, 7, or 10, or a derivative of a coding sequence according to SEQ ID NO:1, 2, 6, 7, or 10 derived through substitution, addition, inversion and/or deletion of one or more bases.

29. The host cell according to Claim 9 that comprises or further comprises a nucleic acid with a sequence according to one of the SEQ ID NO 3 to 5.

30. The host cell according to Claim 9 that comprises or further comprises a recited nucleic acid fragment.

31. The host cell according to Claim 9 that comprises or further comprises a construct having a recited nucleic acid or nucleic acid fragment under the control of an element regulating expression.

32. The transgenic plant, transgenic plant part, seed or host cell according to Claim 11 that comprises or further comprises a nucleic acid having a sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:5.

33. The transgenic plant, transgenic plant part, seed or host cell according to Claim 11 that comprises or further comprises a fragment of said nucleic acid.

34. The transgenic plant, transgenic plant part, seed or host cell according to Claim 11 that comprises or further comprises a construct having said nucleic acid sequence under the control of an element regulating expression.

Rule 126 Amendment